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ABSTRACT

These two units for students in a practical nursing program provide supplemental instruction, with a focus on pharmacology, in caring for adult patients with a respiratory condition. Unit titles are Antibiotics, and Drugs that Affect the Respiratory System. Each unit contains the following: objectives, an introduction, and five to nine learning strategies. A learning strategy may consist of a reading assignment, an information sheet, a task, a laboratory assignment, a clinical experience, a worksheet, viewing of an audiovisual aid, a group activity, or a patient situation (case study). A self evaluation guide is also provided. (YLB)

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CARE OF THE ADULT

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ASSISTING THE ADULT WITH A RESPIRATORY CONDITION
PHARMACOLOGY

TO THE STUDENT:

According to Miller and Keane's Encyclopedia and Dictionary of Medicine and Nursing, pharmacology is defined as "the science that deals with the study of drugs in all its aspects." It is impossible to teach you everything there is to know about medications in a program limited by time. Pharmacology is an ever-changing field as new drugs are discovered and old drugs are constantly being evaluated.

The purpose of the "pharmacology" part of the medical-surgical course will be to give you some basic understanding of the various classifications of drugs and their main uses, side effects, precautions and dangers.

You are responsible for looking up each medication before you administer it. It is important that you make a file card for future reference.

Usual dosages are not discussed in the pharmacology packets but you are responsible for becoming aware of these as you administer medications.

The pharmacology packets have been separated from the other course materials so that you can develop a pharmacology notebook to assist you in the clinical area.

Giving medications is a great responsibility, and acceptance of this responsibility requires a sense of observation and continued study.

THE FACULTY

ASSISTING THE ADULT WITH A RESPIRATORY CONDITION: PHARMACOLOGY

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ASSISTING THE ADULT WITH A RESPIRATORY CONDITION: PHARMACOLOGY

UNIT A: ANTIBIOTICS

Upon completion of this unit, the student will be able to (according to principles and procedures given in suggested references):

1. Define "antibiotic".

2. Differentiate between "narrow-spectrum" and "broad-spectrum" antibiotics.

3. State the main use for Streptomycin.

4. Explain the term "resistance" as it relates to antibiotics.

5. State the two (2) uses of antibiotics.

6. Identify common penicillins and broad-spectrum antibiotics when given a list.

7. Recognize the common side effects, precautions and dangers of penicillins and broad-spectrum antibiotics.

8. Define a given list of 12 terms.

INTRODUCTION

According to Rosdahl's Textbook of Basic Nursing, an antibiotic is "a substance produced by microorganisms which destroys other microorganisms or prevents their growth." In some textbooks, antibiotics are not classified alone but are grouped with the anti-infectives. Anti-infective means "against infection" which accurately describes the action of antibiotics.

THE DISCOVERY OF PENICILLIN BY FLEMING IN 1928 WAS THE BEGINNING OF THE "ANTIBIOTIC AGE"!

LEARNING STRATEGY NO. 1 READING

A. Read about "Antibiotics" in Rosdahl's Textbook of Basic Nursing.

B. Read about "Antibiotics" in Asperheim's Pharmacology for Practical Nurses.

REMEMBER

ANTIBIOTICS SHOULD NOT BE USED INDISCRIMINATELY FOR "MINOR" CONDITIONS AS IT MAY REDUCE THEIR EFFECTIVENESS IN A MORE SEVERE INFECTION.

SOME ANTIBIOTICS ARE ORDERED IN UNITS* PER CC. INSTEAD OF MGM/CC. EXAMPLE: PROCAINE PENICILLIN 200,000 UNITS IM IS OFTEN ORDERED.

* 250 mg. equals 400,000 units

LEARNING STRATEGY NO. 2 WORKSHEET

1. Explain the difference between a "narrow-spectrum" antibiotic and a "broad-spectrum" antibiotic.

2. What does it mean when a microorganism has developed a "resistance" to an antibiotic?

3. Explain how the physician selects the appropriate antibiotic.

4. Explain why penicillin is not a cure-all.

5. Streptomycin is a narrow-spectrum antibiotic. What is the main use of Streptomycin? Name two (2) other uses for Streptomycin:

   Main Use:

   Other Uses:

   a.

   b.

6. Name the four (4) side effects of Streptomycin if the patient is allergic:

   a.

   b.

   c.

   d.

7. Name three (3) side effects that may occur as a result of damage to the 8th (auditory) cranial nerve:

   a.

   b.

   c.

LEARNING STRATEGY NO. 3 INFORMATION SHEET

CLASSIFICATION: Narrow-Spectrum Antibiotics

USES:

1. To inhibit growth of specific organisms.
2. To destroy bacteria.

MOST COMMON DRUGS:

The Penicillins:

Procaine Penicillin G
Ampicillin
Pen Vee K
Crystallin Penicillin G

MOST COMMON SIDE EFFECTS:

1. Nausea and vomiting
2. Diarrhea
3. Mild allergic reaction such as rash, hives
4. Severe allergic reaction

PRECAUTIONS:

1. Should not be given for "minor" conditions.
2. Should not be given if there is a history of hypersensitivity.
3. Patients with a history of other allergies should have a sensitivity test before administering penicillin.

DANGERS:

1. Anaphylactic shock may occur in a hypersensitive person.

2. "Superinfections" may occur when the normal growth of bacteria of body organs is disturbed by antibiotic therapy. Examples: vaginitis, diarrhea, stomatitis, and glossitis.

MOST ORAL PENICILLINS REQUIRE A LARGER DOSAGE THAN WHEN GIVEN I.M. BECAUSE ORAL PENICILLINS CAN BE DESTROYED BY GASTRIC ACIDS.

WHEN GIVING INJECTABLE PENICILLINS:

1. GIVE OIL BASE PENICILLINS DEEP INTO MUSCLES BECAUSE IT ABSORBS MORE SLOWLY. ("DEPO" MEANS OIL BASE)

2. ROTATE THE SITE OF THE INJECTION.

LEARNING STRATEGY NO. 4 INFORMATION SHEET

CLASSIFICATION: Broad-Spectrum Antibiotics

USES:

1. To inhibit the growth of a wide range of organisms.
2. To destroy bacteria.

MOST COMMON DRUGS:

Tetracyclines:

Achromycin
(Tetracycline, Tetrex)
Terramycin
Declomycin

Other:

Erythromycin (Ilosone)
Keflin

MOST COMMON SIDE EFFECTS:

1. Nausea and vomiting
2. Diarrhea

PRECAUTIONS:

1. Serious allergic reactions are rare but still must be considered.

DANGERS:

1. Superinfections may occur.

LEARNING STRATEGY NO. 5 SITUATION

A. Read the following situation.

B. Select the safest response.

C. Check your answer with your instructor.

SITUATION:

Mrs. Johnson is a 36 year old woman who was admitted five days ago with bronchial pneumonia. Her physician has ordered Ampicillin 250 mg. po q 6 hr. When you enter Mrs. Johnson's room to administer the 12N dose of Ampicillin, she states: "I really feel so much better . . . Do I still have to swallow these pills? I don't like to be dependent upon drugs."

NURSING ACTIONS:

1. Explain to Mrs. Johnson that you will withhold the medication until her doctor can be contacted.

2. Insist that Mrs. Johnson take the medication because her doctor ordered the drug.

3. Explain to Mrs. Johnson that the medication gives her a "sense of well-being" but she still has pneumonia.

4. Explain to Mrs. Johnson that the medication is to fight the infection and her physician can best explain when he feels it is advisable to discontinue the drug.

LEARNING STRATEGY NO. 6 TERMS

A. Define the following terms:

1. anti-infective

2. antibiotic

3. superinfection

4. narrow-spectrum antibiotic

5. broad-spectrum antibiotic

6. vaginitis

7. stomatitis

8. glossitis

9. anaphylactic shock

10. bacteriostatic

11. bacteriocidal

12. penicillinase

UNIT B: DRUGS THAT AFFECT THE RESPIRATORY SYSTEM

Upon completion of this unit, the student will be able to (according to principles and procedures given in suggested references):

1. Identify the five (5) groups of drugs used for the respiratory system by name and definition.

2. Recall the three (3) common nebulizer solutions.

3. Explain why the pulse is observed closely when administering Isuprel by inhalation.

4. Name the most common respiratory stimulant and state two (2) uses of it.

5. State the use(s) of expectorants, antitussives and oral bronchodilators.

6. Identify the common expectorants, antitussives and oral bronchodilators.

7. Recognize the common side effects, precautions and dangers of expectorants, antitussives and oral bronchodilators.

INTRODUCTION

All of the medications that affect the respiratory system are used to improve the exchange of oxygen and carbon dioxide in order to meet the body's needs. Drugs that affect the respiratory center are classified into five (5) different groups:

1.	Respiratory Stimulants:	Stimulate the respiratory center to increase the rate of respirations.
2.	Antitussives:	Depress the "cough center" to decrease irritability and exhausting non-productive coughs.
3.	Cough Syrups:	Sooth irritated mucous membranes.
4.	Expectorants:	Liquify the mucus in the brochi and increase the expectoration of sputum.
5.	Bronchodilators:	Dilate the bronchial tubes.

TO BREATHE IS MORE THAN A LUXURY--IT'S LIFE!!

LEARNING STRATEGY NO. 1 READING

A. Read about "Drugs Which Affect the Respiratory System" in Rosdahl's Textbook of Basic Nursing.

B. Read about "Drugs That Affect the Respiratory System" in Asperheim's Pharmacology for Practical Nurses.

C. Review the packet "Assisting the Adult Receiving Inhalation and Intravenous Therapy".

LEARNING STRATEGY NO. 2 WORKSHEET

1. Recall the most common bronchodilator to be used as an inhalation medication with IPPB.

2. Name the five (5) side effects of this bronchodilator:

   a.

   b.

   c.

   d.

   e.

3. What must be closely observed when administering this bronchodilator?

4. What is used to dilute inhalation medications used in the nebulizer?

5. Name the other two (2) common nebulizer solutions:

   a.

   b.

6. What part of the brain is affected by respiratory stimulants?

7. Name at least three (3) uses for carbon dioxide as a respiratory stimulant:

   a.

   b.

   c.

8. Name two (2) other respiratory stimulants:

   a.

   b.

LEARNING STRATEGY NO. 3 INFORMATION SHEET

CLASSIFICATION: Expectorants

USES:

1. To increase or liquify mucus to make expectoration easier.

MOST COMMON DRUGS:

Elixir of Terpin Hydrate (with or without Codeine)
Saturated Solution of Potassium Iodide (SSKI)
Benylin Expectorant

MOST COMMON SIDE EFFECTS:

1. Gastrointestinal disturbances

PRECAUTIONS:

1. Liquid iodides must be diluted.
2. Expectorants should be followed with water unless they are syrups.

DANGERS:

None

LEARNING STRATEGY NO. 4 INFORMATION SHEET

CLASSIFICATION: Antitussive Agents

USES:

1. To relieve coughing.

MOST COMMON DRUGS:

Narcotic	Non-Narcotic
Codeine	Actifed C
Dimetone DC	Dimetone

MOST COMMON SIDE EFFECTS:

1. Nausea and vomiting
2. Dizziness
3. Palpitation
4. Somnolence

PRECAUTIONS:

1. Should not severely inhibit cough if it is productive especially in the sedated or debilitated patient.

DANGERS:

1. Addicting but this is not a problem as these drugs are usually used for a short period of time.

REMEMBER:
EVERY LETTER AND NUMBER ON A MEDICATION MEANS SOMETHING EXTRA HAS BEEN ADDED. EX. "C" MEANS CODEINE ADDED TO DRUG.

LEARNING STRATEGY NO. 5 INFORMATION SHEET

CLASSIFICATION: Oral Bronchodilators

USES:

1. To dilate bronchial tubes.
2. To relieve bronchospasms.

MOST COMMON DRUGS:

Tedral
Tedral SA (sustained action)
Bronchotabs

MOST COMMON SIDE EFFECTS:

1. Gastrointestinal irritation
2. Nausea and vomiting
3. CNS stimulation (irritability, restlessness and insomnia)

PRECAUTIONS:

None

DANGERS:

None

LEARNING STRATEGY NO. 6 SITUATION

A. Read the following situation and answer the question.

Mrs. Jones is a 52 year old woman who has been hospitalized for bronchitis. She is to receive citric acid cough syrup 1 dram q 4 h. After swallowing the cough syrup, she reaches for her glass of water.

1. Why would you ask Mrs. Jones to avoid drinking water for 10-15 minutes?

SELF EVALUATION GUIDE

1. Define "antibiotic".

2. Discuss briefly:

   a. narrow-spectrum antibiotics

   b. broad-spectrum antibiotics

3. State the main use of Streptomycin.

4. If an antibiotic is ineffective in destroying a specific microorganism, we say the microorganism is_____.

5. State the two (2) uses of antibiotics:

   a.

   b.

6. Below is a list of antibiotics. Mark "N" in front of the narrow-spectrum ones and "B" in front of the broad-spectrum ones.

_____ Achromycin	_____ Pen Vee K
_____ Terramycin (Tetracycline)	_____ Keflin
_____ Procaine Penicillin G	_____ Crystallin Penicillin G
_____ Declomycin	_____ Erythromycin (Ilosone)
_____ Ampicillin	

7. Regarding penicillin and broad-spectrum antibiotics, list two (2) common side effects:

   a.

   b.

8. List three (3) precautions for broad-spectrum antibiotics:

   a.

   b.

   c.

9. Name a specific danger for:

   a. broad-spectrum antibiotics:

   b. penicillins (narrow-specutrum antibiotics):

TRUE OR FALSE - Correct the false statements

_____ 10. Stomatitis is inflammation of the stomach.

_____ 11. Bacteriostatic means to stop bacteria or retard its growth.

_____ 12. Bacteriocidal means to kill bacteria.

_____ 13. Glossitis describes a sore tongue.

_____ 14. Anaphylactic shock frequently leads to death.

15. Name the drug used to alleviate (counteract) a penicillin reaction.

Fill in the blank spaces using the following classifications:

Respiratory stimulants
Antitussives
Cough syrups
Expectorants
Bronchodilators

_____ 16. Dilate the bronchial tubes.

_____ 17. Sooth irritated mucous membranes.

_____ 18. Depress the cough center.

_____ 19. Increase the respiratory rate.

_____ 20. Liquify mucus and increases expectoration of sputum.

21. List the three (3) most common nebulizer solutions:

a.

b.

c.

22. Name the most common respiratory stimulant.

23. Identify the following drugs according to classification:

"E" Expectorants
"A" Antitussives
"OB" Oral Bronchodilators

_____ Tedral

_____ Codeine

_____ Elixer of Terpin Hydrate

_____ Benylin

_____ Tedral SA

_____ SSKI

_____ Actifed C

_____ Bronchotabs

_____ Dimetone DC

24. What does the letter "C" mean, for example, in Actifed C?

25. What is the primary side effect when giving antitussives?